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Nine novelties in *Porterandia* (Rubiaceae) from Borneo and Sulawesi

M.S. Zahid

Institute of Biological Sciences,
University of Malaya,
50603 Kuala Lumpur, Malaysia

Summary. Eight new species of, and one new combination in, *Porterandia* (Rubiaceae) are validated. This includes the newly described *P. celebica*, the sole representative of the genus so far known in Sulawesi, where it is endemic.

Porterandia was first described by Ridley (1939), based on *Randia* section *Anisophyllea* Hook. f. in the *Genera Plantarum* (Hooker in Bentham & Hooker 1873), which included only *Randia anisophylla* (Jack ex Roxb.) Hook. f. (based on *Gardenia anisophylla* Jack ex Roxb.). Ridley recognized nine species of *Porterandia* found in the Malay Peninsula and Borneo.

The delimitation of *Porterandia* has been a problem for some time because various authors began to place unrelated species into this genus (Keay 1958, Smith & Darwin 1988, Lo et al. 1999, Tirvengadum 2003). A recent study of the limits of the genus and its defining characters was undertaken as a postgraduate study at the University of Malaya (Zahid 2004) and it was demonstrated that *Porterandia* is centred in Borneo and also distributed in Sumatra, the Malay Peninsula and Sulawesi. Of the novelties discovered from this study, three species that occur on Mount Kinabalu, Borneo, have been validated (Zahid 2003) as a precursor to their enumeration in Volume 5 of *The Plants of Mount Kinabalu* by Professor John H. Beaman and collaborators. The remaining eight new species (including the only known representative of the genus in Sulawesi) and a new combination, are validated in the present paper. A key to all the taxa will be provided in a forthcoming revision of the genus.

THE NEW TAXA

1. Porterandia bruneiensis MS Zahid, **sp. nov.** *Porterandiae macropterae (Miq.) Tirveng. similis sed cymis femineis floribus (sub)sessilibus solitariis, duobus tribusve differt. Typus:*

Simpson 2160 Brunei, Belait, Labi, Bukit Teraja, west slope by summit trail and small valley, about 1 km south of trail (19 Oct 1991) (holotypus L; isotypi KEP, SAN, SING).

Porterandia anisophylla sensu Coode et al., Checkl. Flow. Pl. & Gymn. Brunei (1996) 285, pro parte, quoad *Simpson* 2160, *Thomas* 142; non (Jack ex Roxb.) Ridley (1939).

Porterandia subsessilis sensu Coode et al., Checkl. Flow. Pl. & Gymn. Brunei (1996) 286, quoad *Wong* 1567; non (Val.) Ridley (1939).

(Fig. 1)

Tree, to 12 m high at least, to 8 cm diameter at least, not buttressed. Bark smooth to rough; grey to dark red-brown. Shoot tips, distal branch internodes, petioles and leaf veins with erect-suberect hairs. Stipules ovate-triangular and fused along the edges to form a tube, 0.7–1.5 cm long, densely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole 1–1.7 cm long, 1.5–2.4 mm thick; lamina mostly obovate to elliptic, 13–26 cm long, 6.5–10 cm wide; leaf base cuneate; leaf apex obtuse to short-cuspidate; when dry chartaceous; midrib on upper side flattened to slightly raised, sparsely to densely hairy, on lower side distinctly prominent, densely hairy; secondary veins 9–15 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences:** Peduncle 0.5–1 cm long; habit compact, with 3–4 distinct branching orders, the 1st-order branches 4–6 mm long, the 2nd-order branches 3–5 mm long, the 3rd-order branches 2–3 mm long. Bracts on ultimate/penultimate cyme branches triangular, less than 1/3 the length of the flower calyx. Flowers 9–22 per cyme, usually in 1–3 clusters; pedicels 1–3 mm long, 1.5–2 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes narrow-triangular, 1.5–2.5 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, the tube 8–12 mm long, 2–3 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly elliptic, 5–6 mm long; anthers 3–4 mm long, with pollen; style 6–9 mm long, stigma 2–3 mm long. **Female inflorescences:** Peduncle 0.2–0.4 cm long; habit sparsely branched, with 1 distinct branching order, the 1st-order branches 2–3 mm long. Bracts on ultimate/penultimate cyme branches triangular, less than 1/3 the length of the flower calyx. Flowers 1–3 per cyme; pedicels 0–1.5 mm long, 1–2 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes narrowly triangular to linear, 3–5 mm long and less than 1/3 to 1/2 the length of the calyx limb; corolla hypocrateriform, the tube 8–9 mm long, 2–3 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly elliptic, about 4 mm long; anthers 3–4 mm long, without pollen; style 5–6 mm long, stigma 3–4 mm long. Mature fruiting stalk developing from bisexual inflorescence 2–2.5 cm long, or if developing from unbranched female inflorescence about 2 cm long. **Fruit** sub-globose to ellipsoid, 2.5–3.5 cm long, 2–3.5 cm wide, short-tomentose when young, becoming glabrous. Seeds flattened, lens-shaped to rounded, 4–5 mm × 5–6 mm, testa surface finely areolate.

Fig. 1. *Porterandia bruneiensis.* **A.** Leafy branch with bisexual inflorescences. **B.** Bisexual flower, longitudinal section. All from *Simpson* 2147 (L).

NOTES. Bisexual and female cymes can occur on the same tree (*Simpson* 2160).

DISTRIBUTION. Apparently endemic to Brunei, known only from the Labi-Teraja area in Belait, in primary and secondary mixed dipterocarp forest.

SPECIMENS EXAMINED—BORNEO. BRUNEI: Belait, Labi, Bukit Teraja, trail from Teraja longhouse towards Sarawak border, *Sands* 6014 Brunei (31 Jul 1993 fruits) female (K, KEP, L, SAN, SAR, SING), Bukit Teraja, W slope, by summit trail and small valley, about 1 km S of trail, *Simpson* 2147 (19 Aug 1991 flower-buds, open flowers) bisexual (K, KEP, L, SAN, SING), *Simpson* 2160 (19 Oct 1991 flower-buds, fruits) bisexual & female (holotype L), bisexual (isotypes KEP, SAN, SING), trail to Bukit Teraja, *Wong* WKM 1567 (7 Oct 1989 fruits) female (KEP, L, SAN, SING), Belait, Bukit Sawat new road to Merankin, 10 km from Buau, *Thomas* 142 (30 Dec 1992 flower-buds) bisexual (KEP, L, SAN, SING).

P. bruneiensis closely resembles *P. macroptera* but differs in having 1–3 female flowers per cyme and indistinct flower pedicels (i.e., the flowers are sessile to subsessile). In contrast, *P. macroptera* consistently has a solitary flower in the more reduced female cyme, which has distinct, 2–3-mm-long pedicels. Moreover, *P. bruneiensis* is known only from Brunei, whereas *P. macroptera* is distributed in South and East Kamilantan.

2. Porterandia celebica MS Zahid, **sp. nov.** *Porterandiae anisophyllae (Jack ex Roxb.) Ridl. similis sed bracteis inflorescentiae ad marginem connatis (bracteis cucullatis vel naviculatis) et tubo corollae tecto pilis sursum directis differt. Typus: Coode 6113 Southeast Sulawesi, Kolaka area, Mt Watuwila, above Sanggona, 1100 m (2 Nov 1989) (holotypus K; isotypi BO, L, SING).*

(Fig. 2)

Tree, to 15 m high, to 12 cm diameter, not buttressed. Bark not known. Shoot tips, distal branch internodes, petioles and leaf veins with erect-suberect hairs. Stipules ovate-triangular and fused along the edges to form a tube, 0.8–1.8 cm long, densely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole 0.4–1.2 cm long, 1–2 mm thick; lamina mostly obovate to elliptic, 15–29 cm long, 6–9.5 cm wide; leaf base cuneate; leaf apex acute to obtuse to (sometimes) short-caudate; when dry chartaceous; midrib on upper side flattened to slightly raised, sparsely hairy to densely hairy, on lower side distinctly prominent, sparsely hairy to densely hairy; secondary veins 13–19 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences** (in young flower-bud stage): Peduncle 0.2–0.8 cm long; habit compact, with 2–3 distinct branching orders, the 1st-order branches 3.5–5 mm long, the 2nd-order branches 1–3 mm long, the 3rd-order branches 1–3 mm long. Bracts on ultimate/penultimate cyme branches hood-like to boat-shaped due to fusion, as long as or longer than the flower calyx. Flowers

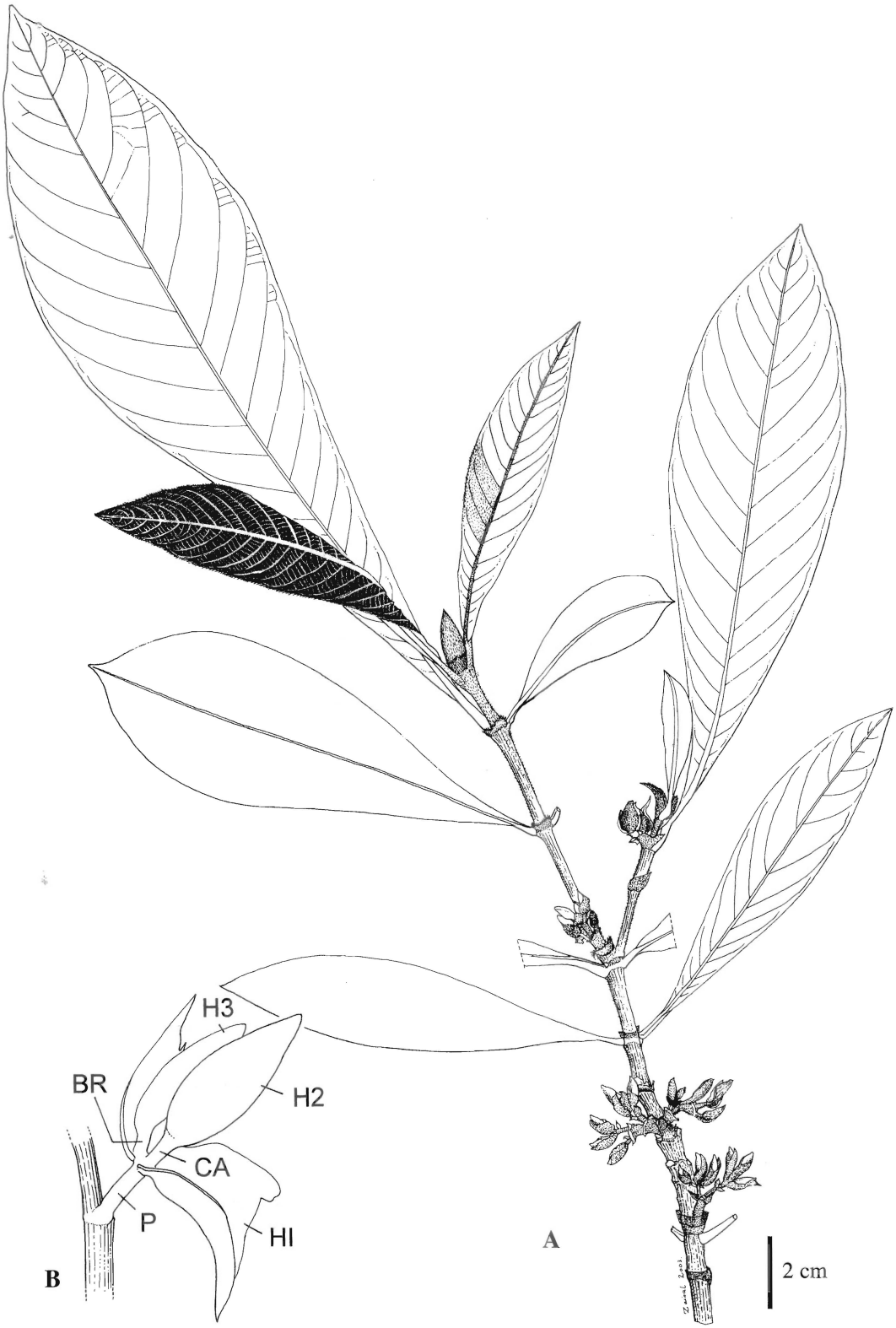

Fig. 2. *Porterandia celebica.* **A.** Leafy branch with bisexual inflorescences. **B.** Diagram of an inflorescence from (A) showing the peduncle (P), central inflorescence axis above this (CA), and only one developed primary branch (BR), with the corresponding hoodlike structures formed by fused bracts marked as H1 (torn), H2 (subtends the undeveloped parts on the central axis) and H3 (subtends the undeveloped parts on the primary branch). All from *Coode* 6113 (holotype, K).

7–13 per cyme, usually in 1–3 clusters; pedicels 1–2 mm long, 1–1.5 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes narrow-triangular to broad-triangular, 1.5–2.5 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, outer surface totally covered by upward-pointing hairs. **Female inflorescences** (in young flower-bud stage): Peduncle 0.25–0.4 cm long; habit sparsely branched, sometimes with only the 1st-order branches distinct, 1.5–3 mm long. Bracts on ultimate/penultimate cyme branches hood-like to boat-shaped due to fusion, as long as or longer than the flower calyx. Flowers 1–3 per cyme; pedicels 1.5–2 mm long, 1–1.5 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes narrowly triangular to linear, 2–3.5 mm long and 1/3 to 1/2 the length of the calyx limb. Mature fruiting stalk developing from bisexual inflorescence 1–2.5 cm long, or if developing from unbranched female inflorescence 1.7–2 cm long. **Fruit** sub-globose to ellipsoid, 2–2.5 cm long, 2–2.3 cm wide, short-tomentose when young, becoming glabrous. Seeds flattened, lens-shaped to rounded, 4–5 mm × 5–6 mm, testa surface finely areolate.

NOTES. Both bisexual and female cymes can be found on the same branch (*Coode* 6201).

DISTRIBUTION. Endemic to southeast Sulawesi, in primary forest (lowland to mossy forest, up to 1100 m altitude, sometimes in swamp forest).

SPECIMENS EXAMINED—SULAWESI: SE Sulawesi, Kolaka, Mt Watuwila, above Sanggona, *Coode* 6201 (5 Nov 1989 flower-buds, fruits) bisexual & female (L), female (K, BO, SING), 1100 m, *Coode* 6113 (2 Nov 1989 flower-buds, fruits) bisexual (holotype K; isotypes BO, L, SING), Kolaka, Tirawuta, Poli-Polia, 150 m, *Prawiroatmodjo & Maskuri* 1389 (21 Oct 1978 fruits) bisexual (K), vegetative (L), 100 m *Prawiroatmodjo & Maskuri* 1435 (22 Oct 1978 fruits) bisexual (K, L); Ahuma, Mt Una'ha, Kendari, 150 m, *Prawiroatmodjo & Maskuri* 1133 (13 Oct 1978 fruits) female (K, L), around Opa swamp, *Prawiroatmodjo & Soewoko* 1886 (22 Nov 1978 fruits) bisexual & female (L).

In *P. celebica* the bracts on the female or bisexual inflorescence (especially the first pair of bracts) are fused along one or both margins, forming very conspicuous, hood-like to boat-shaped structures; such bracts subtending the penultimate or ultimate cyme branches are as long as, or longer than, the flower calyx. In all other species of *Porterandia* known, these inflorescence bracts are not fused. This is the only species of *Porterandia* that is found in Sulawesi.

3. Porterandia congestiflora MS Zahid, **sp. nov.** *Porterandiae catappifoliae Ridl. similis sed inflorescentiis bisexualibus pedunculis brevibus (tantum 1–5 mm longis) ramis reductis multifloralibus differt. Typus: Church et al. 397 West Kalimantan, Sintang, Bukit Baka National Park (29 Oct 1993) (holotypus L; isotypi KEP, KLU, SING).*

(Fig. 3)

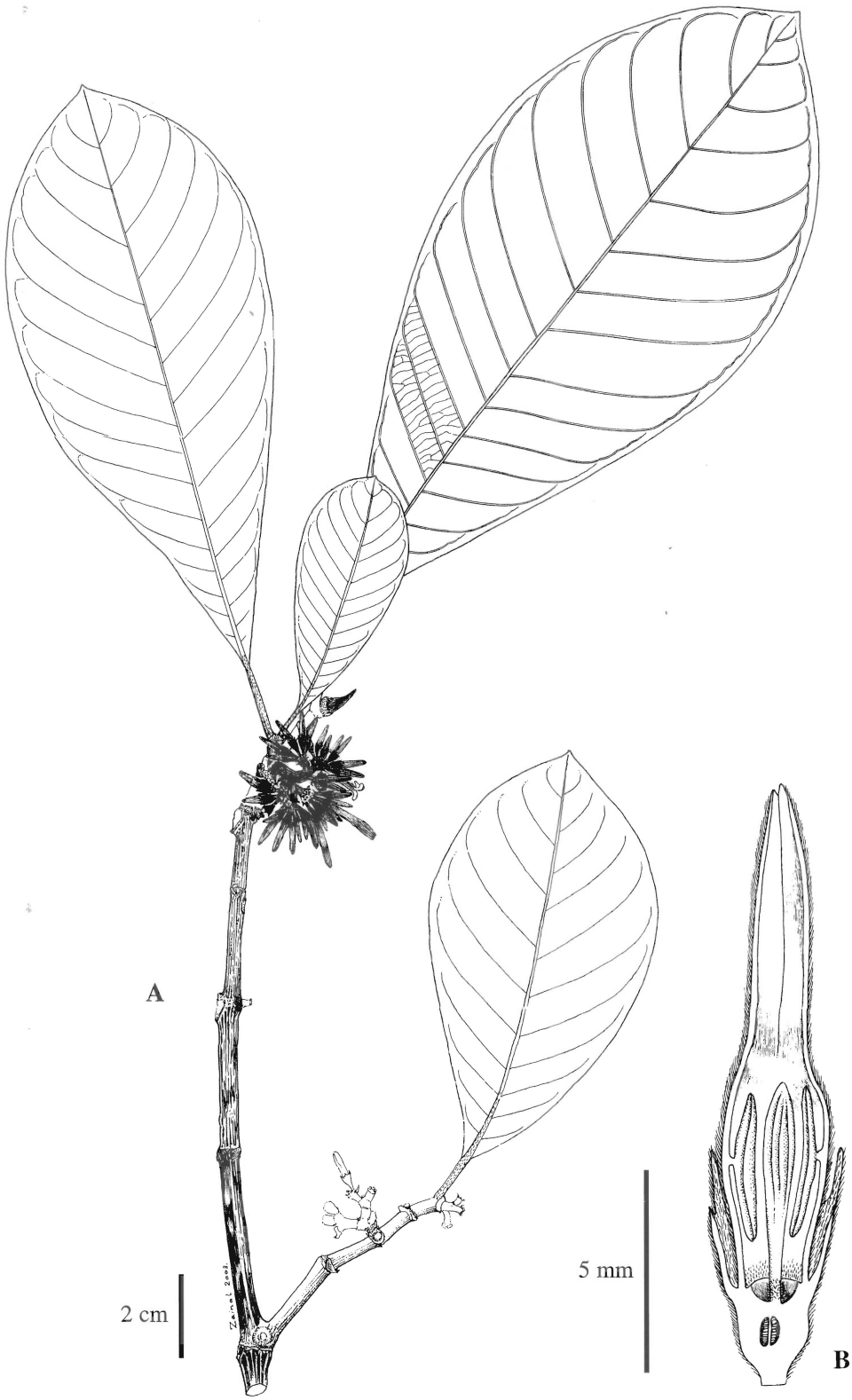

Fig. 3. *Porterandia congestiflora.* **A.** Leafy branch with bisexual inflorescences. **B.** Bisexual flower, longitudinal section. Note many flowers crowded together on reduced inflorescence branches, forming a single tight cluster. A from *Church* et al. 906 (L), B from *Church* et al. 397 (holotype, L).

Tree, to 25 m high, to 30 cm diameter, not buttressed. Bark smooth to fissured, sometimes with lenticels. Shoot tips, distal branch internodes, petioles and leaf veins with appressed hairs. Stipules ovate-triangular and fused along the edges to form a tube, 1.2–2.5 cm long, densely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole 1–3(–3.5) cm long, 1.5–5 mm thick; lamina mostly obovate to elliptic, 10–29.5 cm long, 5.5–14.5 cm wide; leaf base cuneate; leaf apex broadly acute to obtuse; when dry chartaceous to thin-coriaceous; midrib on upper side flattened to slightly raised, glabrous to sparsely hairy, on lower side distinctly prominent, sparsely hairy to densely hairy; secondary veins 10–15(–18) pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences:** Peduncle 0.1–0.5 cm long; habit compact, with all or most branches very short, sometimes with only the 1st-order branches distinct, 1–2(–3) mm long, the 2nd-order branches less distinct, only 1–1.5 mm long. Bracts on ultimate/penultimate cyme branches ovate, less than 1/3 the length of the flower calyx. Flowers 10–25 per cyme, usually in 1 cluster; pedicels 1–2 mm long, 1–1.5 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes short-triangular to linear, 1–3 mm long and less than 1/3 to about 1/2 the length of the calyx limb; corolla hypocrateriform, the tube 8–10 mm long, 1.5–2 mm wide at the throat, without any conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes ovate to elliptic, 4–6 mm long; anthers 3–5 mm long, with pollen; style 5–6 mm long, stigma 3–4 mm long. **Female inflorescences** (in young flower-bud): Peduncle 0.2–0.3 cm long; habit sparsely branched, sometimes with the 1st-order branches distinct, 1–2 mm long. Bracts on ultimate/penultimate cyme branches ovate, less than 1/3 the length of the flower calyx. Flowers 1–2 per cyme; pedicels 1–2 mm long, about 1 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes linear, 1.5–2.5 mm long and 1/3 to 1/2 the length of the calyx limb; corolla hypocrateriform, the tube 5–6 mm long, 1–1.5 mm wide at the throat, without any conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes ovate to elliptic; anthers not examined. Mature fruiting stalk developing from bisexual inflorescence 0.5–1 cm long, or if developing from unbranched female inflorescence 0.6–2 cm long. **Fruit** sub-globose to ellipsoid, 2.5–5.5 cm long, 1.7–4 cm wide, short-tomentose when young, becoming glabrous. Seeds flattened, lens-shaped to rounded, 2–4 mm × 5–9 mm, testa surface finely areolate.

DISTRIBUTION. Known only from central and west Kalimantan, in mixed dipterocarp forest.

SPECIMENS EXAMINED—BORNEO. KALIMANTAN: C Kalimantan, Kota Waringin Timur, km 92 from Sangai (Sg Mentaya), *Amiril* P 7472 (Nov 1993 flower-buds) bisexual (L), *Tuke* P 15308 (Nov 1993 flower-buds) bisexual (L, SAN), *Wilkie* 9515 (13 Apr 1995 fruits) female (KEP, SAN), *Wilkie* 9526 (20 Apr 1995 flower-buds) bisexual (SAN), plot 3, tree no. 358, *Tuke* 94240 (23 May 1994 fruits) bisexual (KEP, L, SAN), plot 5, *Tuke*

P 542 (sine date, flower-buds) female (SAN); W Kalimantan, Kabupaten Sanggau, *de Jong* 470 (10 Aug 1993 fruits) female (L), *Peters & Susanto* 1145 (9 Jan 1994 fruits) female (L), *Peters & Susanto* 1185 (4 Mar 1994 fruits) bisexual (L), W Kalimantan, Gunung Bentuang, 5–10 km N of Masa village, 150 km NE of Pontianak, *Burley & Tukirin* 2342 (7 Jun 1989 fruits) bisexual (L), female (K, KEP, SING), W Kalimantan, Sintang, HPH km 70, NE of camp, *Church* et al. 733 (7 Apr 1994 fruits) female (L, SING), W Kalimantan, Sintang, HPH km 70, SE of camp, 110 m, *Church* et al. 906 (14 Apr 1994 flower-buds, open flowers) bisexual (L, SING), W Kalimantan, Sintang, HPH km 84, N of camp along Sungai Posang, *Church* et al. 1242 (30 Apr 1994 fruits) bisexual (BO, L, SING), W Kalimantan, Sintang, HPH km 87, S along Sungai Posang, *Church* et al. 1115 (25 Apr 1994 flower-buds) bisexual (L, SING), W Kalimantan, Sintang, Bukit Baka National Park, *Church* et al. 178 (17 Oct 1993 fruits) female (BO, L), *Church* et al. 397 (29 Oct 1993 flower-buds, fruits) bisexual (holotype L; isotypes KEP, KLU, SING), W Kalimantan, Bukit Raya, *Nooteboom* 4501 (11 Jan 1983 fruits) female (L), *Nooteboom* 4781 (3 Nov 1983 fruits) female (BO, L), 4833 (6 Nov 1983 fruits) bisexual (L), female (BO), 5045 (6 Nov 1983 vegetative) (L), W Kalimantan, Karimata, Pulau Karimata Besar, *Mondi* 218 (26 Mar 1931 fruits) female (L), W Kalimantan, Permantang, S of Kwala Kwajan, *Alston* 13366 (27 Jan 1954 fruits) female (L).

P. congestiflora has close similarities with *P. catappifolia* Ridl. and *P. glabrifolia* Ridl. but differs significantly from these species in having linear calyx lobes and smaller corolla (tube to 2 mm wide only). In the two other species, the calyx lobes are broadly to narrowly triangular and the corolla is larger (the tube 2.5–4.5 mm wide). These three species form a group closely related to *P. laxiflora*, but differ from that species in their more compact bisexual inflorescence branching (with only 1–2 orders of distinct branches, i.e., branches at least 3 mm long); whereas in *P. laxiflora*, the bisexual inflorescence has 3–4 orders of distinct branches, and a more diffuse habit.

4. Porterandia hosei (Merrill) M.S. Zahid, **comb. nov.** *Type: Hose 660, Sarawak, Miri, Baram (Apr 1895) (holotype K; isotype L).*

Timonius hosei Merrill, J. Str. Br. Roy. As. Soc. 77 (1917) 239, Bibl. En. Born. Pl., J. Str. Br. Roy. As. Soc., Sp. No. (1921) 569.

Porterandia minor Ridley, Kew Bull. Misc. Inf. (1939) 594, pro parte, quoad *Hose* 660.
(Fig. 4)

Tree, to 18 m high, to 17 cm diameter, not buttressed. Bark smooth; light brown. Shoot tips, distal branch internodes, petioles and leaf veins with erect-suberect hairs. Stipules ovate-triangular and fused along the edges to form a tube, 0.8–1 cm long, densely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole 1–2 cm long, 2–2.5 mm thick;

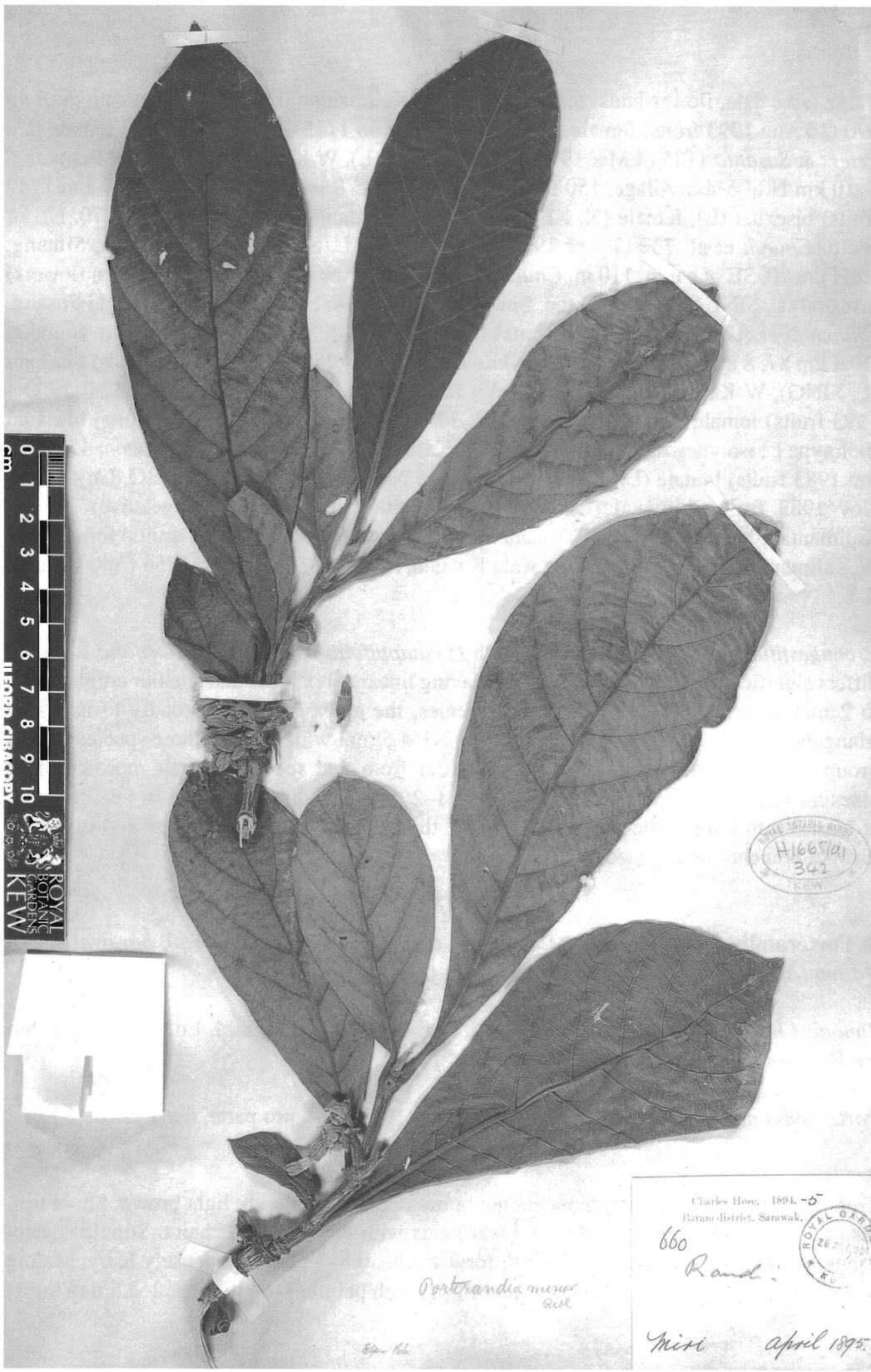

Fig. 4. The holotype specimen of *Porterandia hosei* (Merrill) MS Zahid: *Hose* 660 (K).

lamina mostly obovate, 15–30 cm long, 8–13 cm wide; leaf base cuneate; leaf apex acute to obtuse, sometimes short-cuspidate; when dry chartaceous; midrib on upper side flattened to slightly raised, densely hairy, on lower side distinctly prominent, densely hairy; secondary veins 11–17 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences:** Peduncle 0.5–0.8 cm long: habit compact, with 1–3 distinct branching orders, the 1st-order branches 3–5 mm long, the 2nd-order branches 3–5 mm long, the 3rd-order branches 2–3 mm long. Bracts on ultimate/penultimate cyme branches triangular, less than 1/3 the length of the flower calyx. Flowers 7–23 per cyme, usually in 1–3 clusters; pedicels 0.5–1 mm long, 1–2 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes broad-triangular, 0.5–1 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, the tube 10–12 mm long, 3–4 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes ovate to elliptic, 3–4 mm long; anthers 3–4 mm long, with pollen; style 8–9 mm long, stigma 2–3 mm long. **Female inflorescences:** Peduncle 0.2–0.3 cm long; habit sparsely branched, sometimes with only the 1st-order branches distinct, 1–3 mm long. Bracts on ultimate/penultimate cyme branches narrowly triangular, less than 1/3 the length of the flower calyx. Flowers 1–3 per cyme; pedicels 2–3 mm long, 1–2 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes broad-triangular, 1–1.5 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, the tube 9–10 mm long, 2–3 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly elliptic, 5–6 mm long; anthers 3–4 mm long, without pollen; style 5–6 mm long, stigma 3–4 mm long. Mature fruiting stalk developing from unbranched female inflorescence about 2.5 cm long. **Fruit** sub-globose, about 4 cm long, about 3.5 cm wide, short-tomentose when young, becoming glabrous. Seeds not examined (only one fruit known).

DISTRIBUTION. Known only from the Miri-Baram area in northeast Sarawak, in peat and freshwater swamp forest.

SPECIMENS EXAMINED—BORNEO. SARAWAK: Miri, Baram, *Hose* 660 (Apr 1895 flower-buds, open flowers) bisexual (holotype K; isotype L), Miri, Niah River, Ulu Sungai Sekaloh, *Wright* S 29144 (7 Dec 1966 fruits) female (SAR); Bintulu, Sungai Meluang, Niah-Jelalong F.R., *Brunig* 958 (16 Dec 1959 flower-buds) female (SAR).

P. hosei shows close similarities with *P. bruneiensis* and *P. macroptera* but differs consistently from these two species in having broad-triangular and shorter (0.5–1.5 mm long only) calyx lobes in the female flower; also, *P. hosei* is found in the peat and freshwater swamp forest of the Miri-Baram area in the northeast of Sarawak. The other two species have narrowly triangular to linear, longer (2.5–5 mm long) calyx lobes of the female flower and are found in the dryland mixed dipterocarp forest in Brunei and South and East Kalimantan. These three species form a group that is related to *P. minor* Ridl. but differ from

that species in their smaller female flowers (calyx up to 4 mm wide only, corolla tube 2–3 mm wide only); whereas *P. minor* has larger female flowers (calyx 5–6 mm wide, corolla tube 4–5 mm wide).

5. Porterandia kalimantanensis MS Zahid, **sp. nov.** *Porterandiae grandifoliae Ridl. similis sed inflorescentiis bisexualibus distincte pedunculatis (pedunculis saltem 5–7 mm longis) inflorescentiisque femineis sparsim ramosis differt. Typus: Church et al. 648 West Kalimantan, Sintang, Bukit Baka National Park, 200 m from logging road between km 39 and km 40, environs bordering national park and SBK (9 Nov 1993) (holotypus L; isotypi KEP, SING).*

Tree, to 9 m high, to 20 cm diameter, not buttressed. Bark lenticellate to grid-cracked; yellowish-brown to grey brown. Shoot tips, distal branch internodes, petioles and leaf veins with erect-suberect hairs. Stipules ovate-triangular and fused along the edges to form a tube, 1–1.5 cm long, densely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole obsolete or subobsolete, only 0–0.15 cm long, 1–2 mm thick; lamina mostly obovate to elliptic, 15–29 cm long, 6–12.5 cm wide; leaf base cuneate; leaf apex acute to obtuse to short-caudate; when dry chartaceous; midrib on upper side flattened to slightly raised, densely hairy, on lower side distinctly prominent, densely hairy; secondary veins 13–18 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences:** Peduncle 0.5–0.7 cm long; habit compact, with 2–3 distinct branching orders, the 1st-order branches 4–6 mm long, the 2nd-order branches 1.5–3 mm long, the 3rd-order branches 1–3 mm long. Bracts on ultimate/penultimate cyme branches narrowly triangular, less than 1/3 the length of the flower calyx. Flowers 7–17 per cyme, usually in 1–3 clusters; pedicels 1–2 mm long, 1–2 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes short-triangular, 0.5–1 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, the tube 9–12 mm long, 3.5–4 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly ovate to elliptic, 5–6 mm long; anthers 4–5 mm long, with pollen; style 7–9 mm long, stigma 2–3 mm long. **Female inflorescences** not known in the flowering state, with the following information inferred from fruiting cymes: habit sparsely branched, with 1–2 distinct branching orders, with 2(–more ?) flowers, bracts on ultimate/penultimate cyme branches narrowly triangular, less than 1/3 the length of the flower calyx; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes short triangular, 0.5–1 mm long and less than 1/3 the length of the calyx limb. Young fruiting stalk developing from unbranched female inflorescence 1.5–2 cm long. **Fruit** (young) ellipsoid, 2–2.4 cm long, 1.3–1.5 cm wide, short-tomentose. Seeds not examined.

DISTRIBUTION. Only known in west Kalimantan, in primary and old secondary mixed dipterocarp forest.

SPECIMENS EXAMINED—BORNEO. KALIMANTAN: W Kalimantan, Sintang, Bukit Baka National Park, S of camp across Sungai Ella, *Church* et al. 137 (16 Oct 1993 flower-buds) bisexual (BO, KEP, L, SING), Bukit Baka National Park, 200 m from logging road between km 39 and km 40, environs bordering national park and SBK, *Church* et al. 648 (9 Nov 1993 flower-buds, open flowers) bisexual (holotype L; isotypes KEP, SING); W Kalimantan, Seraway, 8 km NE of Desa Jelundong, Batu Lintang, 1 km NE of camp, *Church, Mahyar & Afriastini* 1629 (30 Jan 1995 flower-buds) bisexual (BO, L), Seraway, 8 km NE of Desa Jelundong, Batu Lintang, 1.5 km SW of camp, *Church, Mahyar & Afriastini* 1656 (1 Feb 1995 fruits) female (L, SAN).

P. kalimantanensis and *P. lambirensis* are closely related, except that *P. kalimantanensis* has a dense-hairy calyx (the calyx surface is not visible among the hairs) with short-triangular (only 0.5–1 mm long) lobes in the bisexual flowers, and *P. lambirensis* has a sparse-hairy calyx (the calyx surface is visible among the hairs) with longer, narrowly triangular (1–1.5 mm long) lobes in the bisexual flower. *P. kalimantanensis* is found only in west Kalimantan; *P. lambirensis* occurs only in the Mulu-Lambir-Belait area of northwest Borneo.

6. Porterandia lambirensis MS Zahid, **sp. nov.** *Porterandiae grandifoliae Ridl. similis sed inflorescentiis bisexualibus distincte pedunculatis calyceque minus piloso differt. Typus: Tong S 37004 Sarawak, Miri, Lambir Hills, 21 ml Lambir-Subis road, on hill slope in hill dipterocarp forest (9 Apr 1976) (holotypus SAR; isotypi K, KEP, L, SAN).*

(Fig. 5)

Tree, to 19 m high, to 26 cm diameter, not buttressed. Bark smooth to slightly cracking; brown to pale grey. Shoot tips, distal branch internodes, petioles and leaf veins with erect-suberect hairs. Stipules ovate-triangular and fused along the edges to form a tube, 1–2.5 cm long, densely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole obsolete or subobsolete, only 0.2–0.5 cm long, 1.5–3 mm thick; lamina mostly obovate to elliptic, 19–30(–40) cm long, 7.5–15.5 cm wide; leaf base cuneate; leaf apex acute to obtuse; when dry chartaceous; midrib on upper side flattened to slightly raised, densely hairy, on lower side distinctly prominent, densely hairy; secondary veins 14–26 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences:** Peduncle 0.5–0.7 cm long; habit compact, with 2–3 distinct branching orders, the 1st-order branches 4–7 mm long, the 2nd-order branches 2–4 mm long, the 3rd-order branches 0.5–1.5(–3) mm long. Bracts on ultimate/penultimate cyme branches narrowly triangular, less than 1/3 the length of the flower calyx. Flowers 7–12 per cyme, usually in 1–2 clusters; pedicels 1–2 mm long, 1–2 mm thick; calyx tube/limb sparsely covered by hairs (much of calyx surface visible); calyx lobes narrow-triangular, 1–1.5 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, the tube 9–10 mm long, 3–3.5 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly elliptic, 5–6 mm long; anthers

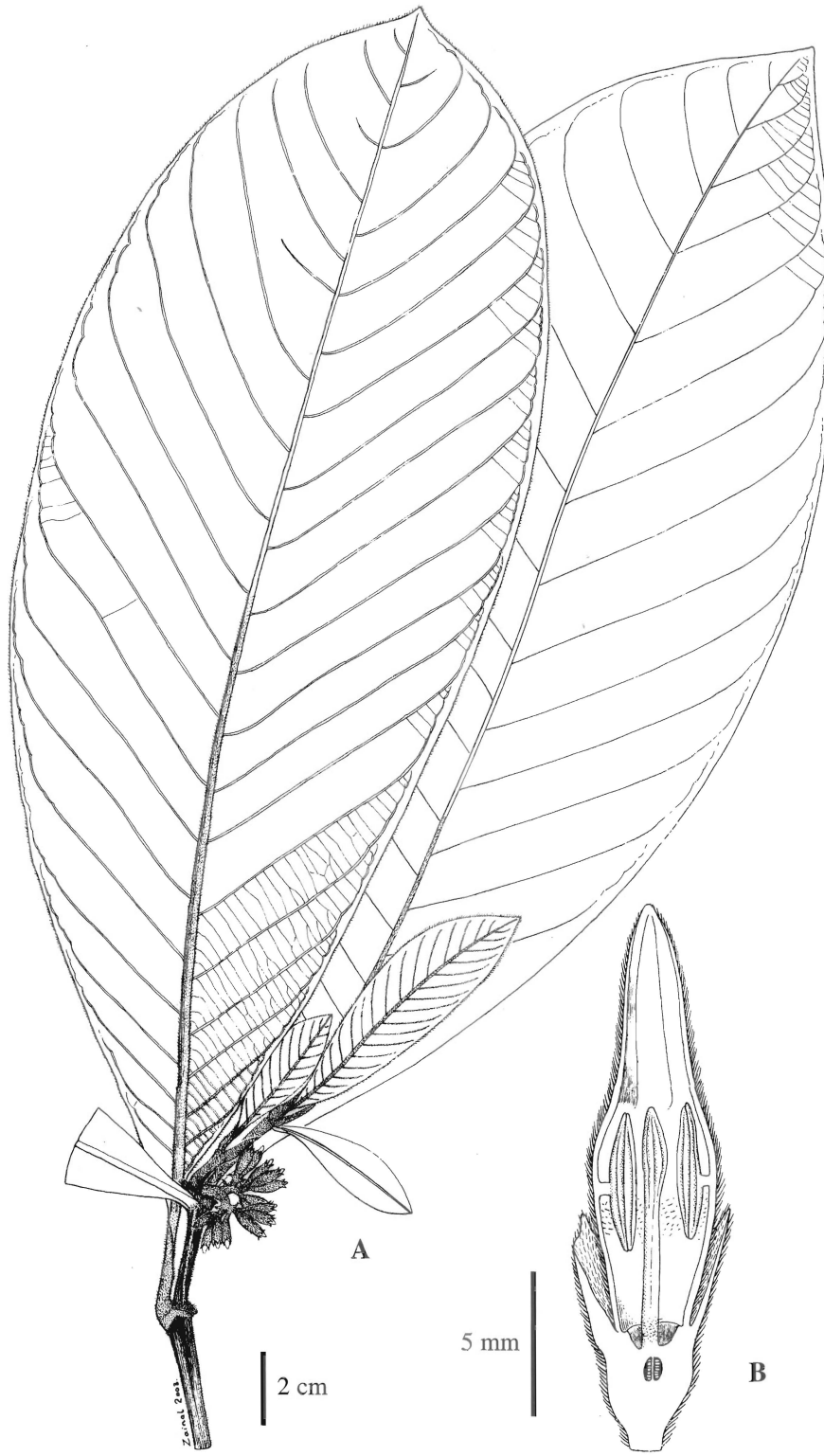

Fig. 5. *Porterandia lambirensis.* **A.** Leafy branch with bisexual inflorescence. **B.** Bisexual flower, longitudinal section. A from *Tong* S 37004 (isotype, K), B from *Sibat* S 24142 (SAN).

4–5 mm long, with pollen; style 7–8 mm long, stigma 2–3 mm long. **Female inflorescences** not known in the flowering state, with the following information inferred from fruiting cymes: habit sparsely branched, with 1–2 distinct branching orders, with 1–2(–more?) flowers, bracts on ultimate/penultimate cyme branches narrowly triangular, less than 1/3 the length of the flower calyx; calyx tube/limb sparsely covered by hairs (much of calyx surface visible); calyx lobes narrowly triangular, 1–1.5 mm long and less than 1/3 the length of the calyx limb. Mature fruiting stalk developing from unbranched female inflorescence about 2 cm long. **Fruit** sub-globose, about 3 cm long, about 3 cm wide, sparsely hairy when young, becoming glabrous. Seeds not examined (only one fruit known).

DISTRIBUTION. Northwest Borneo (Mulu-Lambir-Belait area), in primary and secondary mixed dipterocarp forest. It occurs, as does *P. minor*, in the 52-hectare ecological plot at the Lambir Hills National Park in Sarawak.

SPECIMENS EXAMINED—BORNEO. BRUNEI: Belait, Andulau F.R., compt. 7, *Wong* WKM 597 (7 Dec 1988 fruits) female (KEP, L, SAN, SING). **SARAWAK:** Miri, Lambir Hills National Park, ml 21 [km 34] Lambir–Subis road, *Tong* S 37004 (9 Apr 1976 flower-buds) bisexual (holotype SAR; isotypes K, KEP, SAN), *Sibat* S 24142 (29 Apr 1966 flower-buds) bisexual (KEP, SAN, SING).

P. lambirensis closely resembles *P. kalimantanensis*; see under that species for the main differences.

7. Porterandia laxiflora MS Zahid, **sp. nov.** *Porterandiae pauciflorae Ridl. similis sed apice, ramis foliisque maturis pilosis, limbo calycis dense piloso et calyce florum bisexualium destituto colleteribus differt. Typus: Sibat S. 24374 Sarawak, Miri, Ulu Mamut Bakong, 100 ft (15 Mar 1966) (holotypus SAR; isotypi BO, K, KEP, SAN, SING).*

(Fig. 6)

Tree, to 12 m high, to 38 cm diameter, not buttressed. Bark "scaly"; yellowish brown. Shoot tips, distal branch internodes, petioles and leaf veins with appressed hairs. Stipules ovate-triangular and fused along the edges to form a tube, 0.6–1 cm long, sparsely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole 0.7–2.5 cm long, 1–2 mm thick; lamina mostly obovate, 14–24 cm long, 6.8–11.5 cm wide; leaf base cuneate; leaf apex broadly acute to obtuse with short point; when dry chartaceous; midrib on upper side flattened to slightly raised, sparsely hairy to densely hairy, on lower side distinctly prominent, sparsely hairy to densely hairy; secondary veins 9–15 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences** (in advanced flower bud stage): Peduncle 0.6–0.9 cm long; habit laxly branched, with 3–4 distinct branching orders, the 1st-order branches 5–11 mm long, the 2nd-order branches 5–7 mm long, the 3rd-order branches 3–6 mm long. Bracts on ultimate/penultimate cyme branches

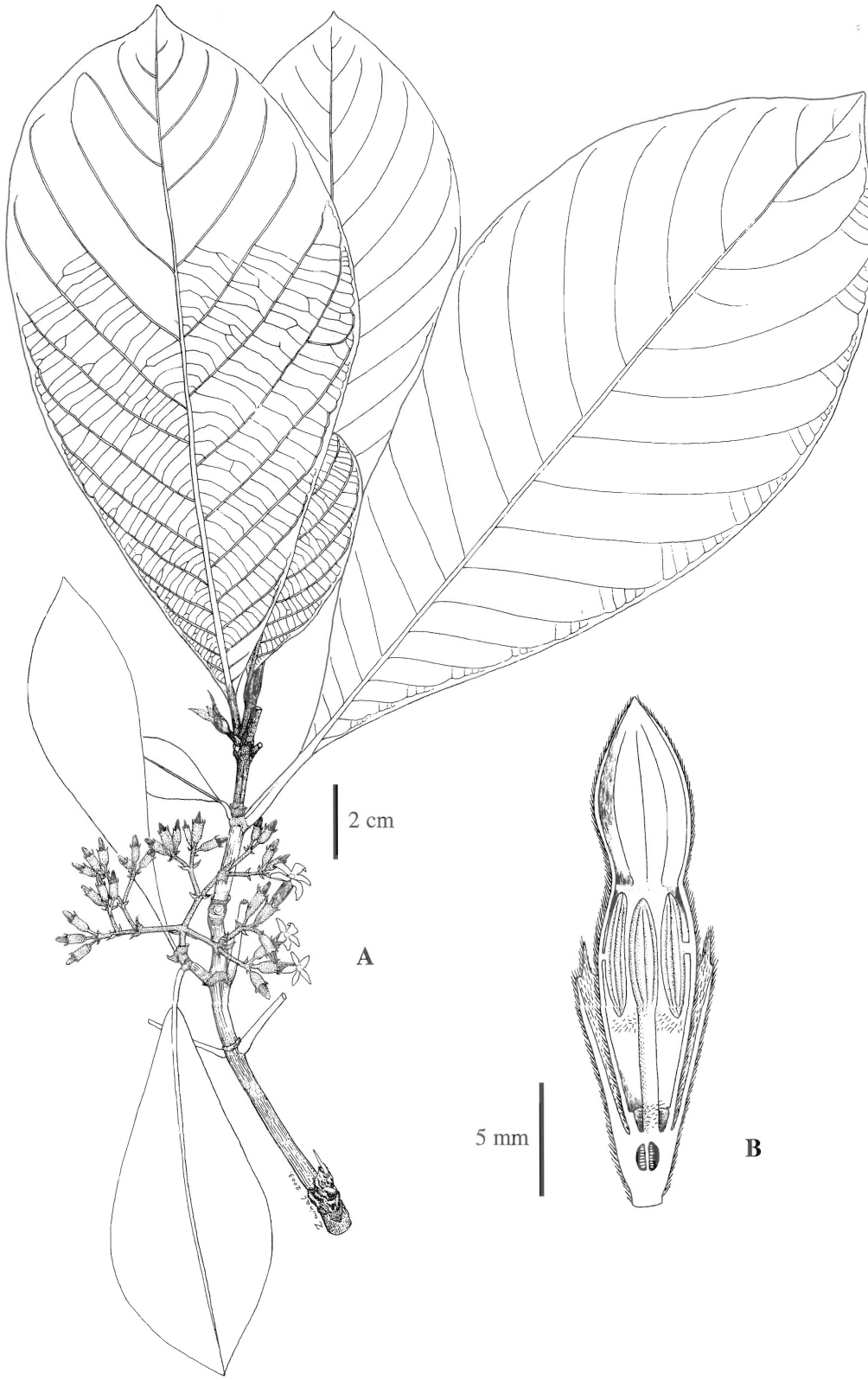

Fig. 6. *Porterandia laxiflora.* **A.** Leafy branch with bisexual inflorescence. **B.** Bisexual flower, longitudinal section. Note inflorescence branching with 3–4 orders of distinct branches. A from *Sibat* S 24374 (isotype, K), B from *Sibat* 24374 (isotype, BO).

ovate to narrowly triangular, less than 1/3 the length of the flower calyx. Flowers 9–26 per cyme, usually in 1–3 clusters; pedicels 2–3 mm long, 1–1.5 mm thick; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes narrow-triangular, 1.5–2 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, the tube 12–15 mm long, 3–4 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes elliptic, 5–7 mm long; anthers 4–5 mm long, with pollen; style 5–6 mm long, stigma 3–4 mm long. **Female inflorescences** not known in the flowering state, with the following information inferred from fruiting cymes: habit unbranched, with a solitary flower, bracts narrowly triangular, less than 1/3 the length of the flower calyx; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes narrowly triangular and less than 1/3 the length of the calyx limb. Mature fruiting stalk developing from bisexual inflorescence about 3.6 cm long, or if developing from unbranched female inflorescence about 1.5 cm long. **Fruit** sub-globose, 3.2–5 cm long, 3–3.5 cm wide, short-tomentose when young, becoming glabrous. Seeds not examined.

DISTRIBUTION. Known only in the northeast Sarawak/Miri area, in mixed dipterocarp forest.

SPECIMENS EXAMINED—BORNEO. SARAWAK: Limbang, Sg Ensungei, Tg Long Amok, *Rena* S 42839 (11 Sep 1980 fruits) female (KEP, SAN, SAR), Limbang, Ulu Sg Kapulu, Bukit Bugoh, *Wright* S 25263 (6 Mar 1967 fruits) bisexual (KEP, SAN, SING); Miri, Ulu Mamut Bakong, 100 ft [30 m], *Benang anak Bubong* S 24394 (18 Mar 1966 fruits) bisexual (KEP, SAR, SING), *Sibat* S. 24374 (15 Mar 1966 flower-buds, open flowers) bisexual (holotype SAR; isotypes BO, K, KEP, SAN, SING).

P. laxiflora is one of the several species of the genus which are characterized by appressed hairs on the shoot tips, petioles and leaf veins (as opposed to other species which are either glabrous completely or have erect to suberect hairs on these parts). In this group, it is specially distinguished in having a rather diffuse branching habit of the bisexual inflorescence (with to 3–4 orders of distinct branches) and corolla tubes covered with upward-pointing hairs. The other allied species have either a more compact bisexual inflorescence with only 1–2 orders of distinct branches (*P. congestiflora*, *P. catappifolia*, *P. glabrifolia*, all Bornean), or corolla tubes covered with downward-pointing hairs (*P. scortechinii* from the Malay Peninsula).

8. Porterandia postarii MS Zahid, **sp. nov.** *Porterandiae pauciflorae Ridl. similis sed dentibus calycis florum bisexualium femineorumque breviter triangularibus, tantum 0.5–1.5 mm longis, et pedicellis florum bisexualium 13–34 mm longis differt. Typus: Zahid ZMS 17 Sabah, Telupid, Kuamas Forest Reserve (24 May 2002) (holotypus SAN; isotypus KLU).*

(Figs. 7 & 8)

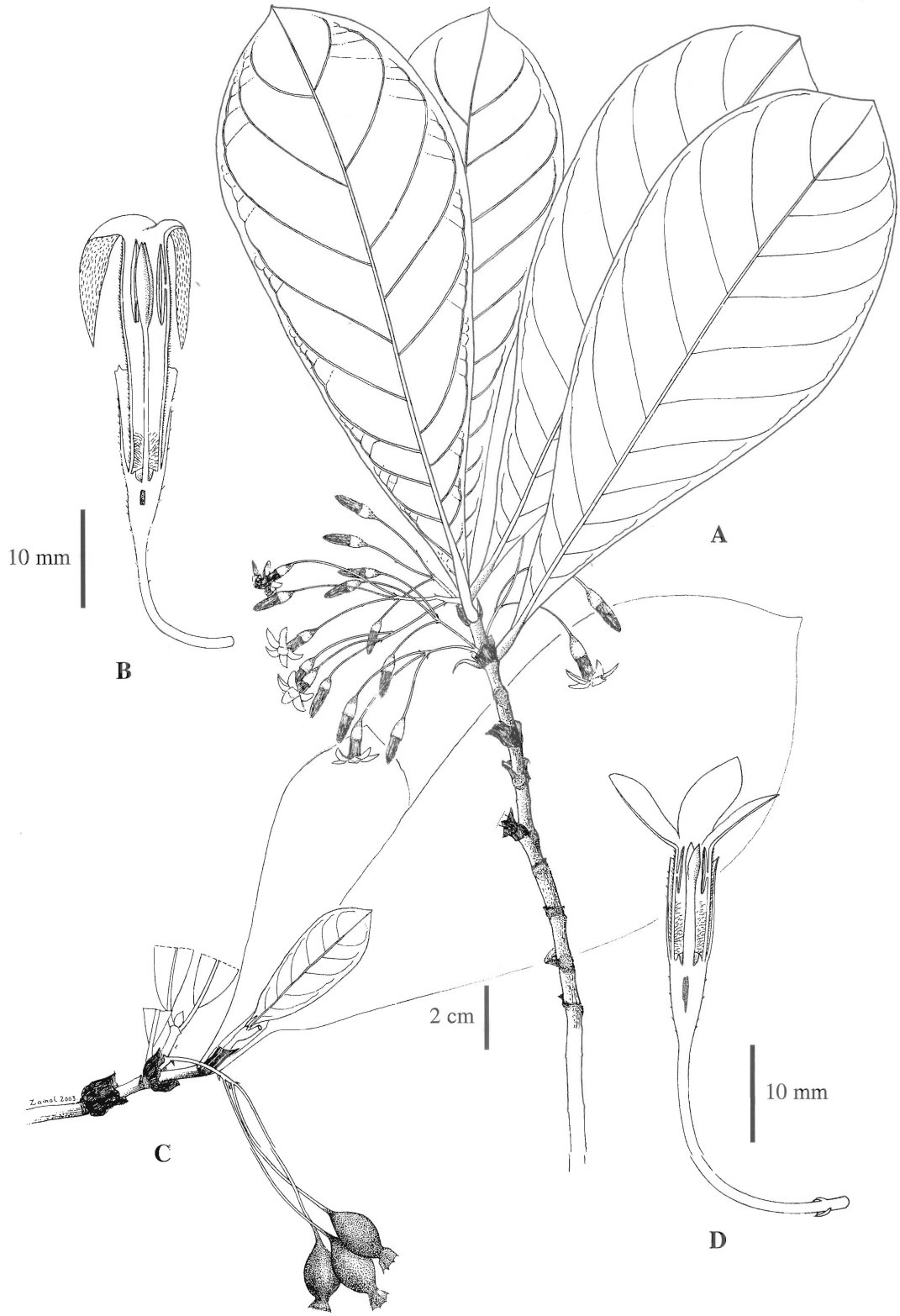

Fig. 7. *Porterandia postarii.* **A.** Leafy branch with bisexual inflorescences. **B.** Mature bisexual flower, longitudinal section (style glabrous). **C.** Leafy bisexual fruiting branch (long fruiting stalk). **D.** Mature female flower, longitudinal section (style glabrous). Note glabrous leaves. A–C from *Zahid* et al. ZMS 17 (isotype, KLU), D from *Zahid* et al. ZMS 18 (KLU).

Tree, to 15 m high, to 25 cm diameter, not buttressed. Bark smooth to lightly fissured; greyish to dark brown. Shoot tips, distal branch internodes, petioles and leaf veins glabrous. Stipules ovate-triangular and fused along the edges to form a tube, 0.8–1.3 cm long, glabrous. Mature **leaves** (not immature leaves near the shoot-tips) with petiole 0.4–0.7(–1.5) (very rarely to 1.8) cm long, 1.5–4 mm thick; lamina mostly obovate to elliptic, 17–30 cm long, 6.5–12 cm wide; leaf base cuneate; leaf apex obtuse with short point; when dry chartaceous; midrib on upper side flattened to slightly raised, glabrous, on lower side distinctly prominent, glabrous; secondary veins 8–15 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences:** Peduncle 0.5–1.6 cm long; habit laxly branched, with 2–3 distinct branching orders, the 1st-order branches 10–34 mm long, the 2nd-order branches 6–30 mm long, the 3rd-order branches 4–5 mm long. Bracts on ultimate/penultimate cyme branches triangular, less than 1/3 the length of the flower calyx. Flowers 5–13 per cyme, without distinct clusters; pedicels 13–34 mm long, 0.5–1 mm thick; calyx tube/limb sparsely covered by hairs (much of calyx surface visible); calyx lobes triangular, 0.5–1 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, the tube 10–13 mm long, 2–3 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes narrowly ovate to elliptic, 5–8 mm long; anthers 5–6 mm long, with pollen; style 7–8 mm long, stigma 3–4 mm long. **Female inflorescences:** Peduncle 0.4–1.1 cm long; habit unbranched. Bracts on ultimate/penultimate cyme branches triangular, less than 1/3 the length of the flower calyx. Flowers 1 per cyme; pedicel 28–35 mm long, 0.5–1 mm thick; calyx tube/limb sparsely covered by hairs (much of calyx surface visible); calyx lobes short, needle-like, about 1.5 mm long and less than 1/3 the length of the calyx limb; corolla hypocrateriform, the tube 10–12 mm long, 3.5–4 mm wide at the throat, with a conspicuous inflated part just below the throat, outer surface totally covered by upward-pointing hairs; corolla lobes ovate to elliptic, 7–10 mm long; anthers about 5 mm long, without pollen; style 8–9 mm long,

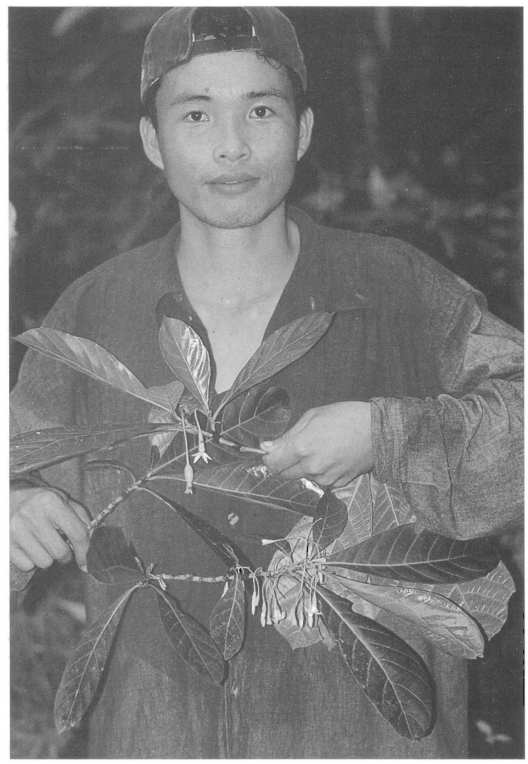

Fig. 8. The unbranched, solitary-flowered female inflorescences (upper branch) and branched, multi-flowered bisexual inflorescences (lower branch) of *Porterandia postarii*, with exceptionally long flower and fruit pedicels. Female branch from *Zahid* et al. ZMS 18 (KLU); bisexual branch from *Zahid* et al. ZMS 17 (isotype, KLU).

stigma 3–3.5 mm long. Mature fruiting stalk developing from bisexual inflorescence 6–10 cm long, or if developing from unbranched female inflorescence 3.5–9 cm long. **Fruit** subglobose to ellipsoid, 2.5–4.8 cm long, 2.2–3 cm wide, sparsely hairy when young, becoming glabrous. Seeds flattened, lens-shaped to rounded, 3–5 mm × 6–8 mm, testa surface finely areolate.

DISTRIBUTION. Sabah, so far known only from the Telupid-Tongod area to Gunung Silam (Lahad Datu), in forest developing on ultramafic soils.

SPECIMENS EXAMINED—BORNEO. SABAH: Labuk Sugut, Ulu Sg Buan, *Aban & Soinin* SAN 67150 (18 Sep 1984 fruits) bisexual (KEP, SAN, SING), Labuk Sugut, Tawai, Sg Meliau, *Bojo & Cheksum* OB 24 (8 Apr 1994 fruits) bisexual (KEP); Telupid, Kuamas F.R., *Zahid* et al. ZMS 17 (24 May 2002 flower-buds, open flower, fruits) bisexual (holotype SAN; isotype KLU), *Zahid* et al. ZMS 18 (24 May 2002 open flowers, fruits) female (KLU, SAN), near Kotai river, *Postar & Sahani* SAN 140873 (11 Aug 2001 fruits) bisexual (SAN), Telupid, Bukit Tawai F.R., Sg Meliau, *Soepadmo* et al. FRI 41315 (8 Apr 1994 fruits) female (KEP, SAN, SING), Telupid, upper Sg Meliau, off Sg Karamuak, 140 m, *Zainuddin* 4938 (8 Apr 1994 fruits) bisexual (SAN); Kinabatangan, Tongod, Gunung Tingkar, *Wong* WKM 2217 (24 Aug 1992 fruits) bisexual (KEP, L, SAN); Lahad Datu, Mt Silam, at TV station, 200 m, *Maikin & Lideh* SAN 67516 (13 Aug 1984 fruits) female (SAN), Mt Silam, RP 310/12B, 1470 ft [448 m], *Proctor* SAN 100902 (5–9 Sep 1983 fruits) bisexual (SAN), Mt Silam, 1700 ft [518 m], *Perumal & Dewol* SAN 135049 (12 Jul 1994 fruits) bisexual (KEP, SAN), Mt Silam, RP 301, 2600 ft [792 m], *Shea* SAN 75174 (10 Mar 1972 fruits) bisexual (SAN), RP 310, 2600 ft [792 m], *Shea* SAN 75182 (13 Mar 1972 fruits) bisexual (SAN), R.P. 310/18B, 2650 ft [808 m], *Proctor* SAN 100717 (15 Aug 1983 fruits) female (SAN).

P. postarii is closely related to *P. pauciflora*. These two species of *Porterandia* are the only ones with glabrous shoot tips, petioles and leaves. *P. postarii* is different from *P. pauciflora* in having unusually long bisexual flower pedicels (13–34 mm) and leaves drying with the fine tertiary veins visible as a much-branched network between pairs of secondary veins. *P. pauciflora* has shorter bisexual flower pedicels (3–8 mm long) and leaves that dry with the fine tertiary veins visible as just simple connections between pairs of secondary veins. Also, *P. postarii* is restricted to Sabah and found only on ultramafic soils. In contrast, *P. pauciflora* is restricted to the Brunei and northeast Sarawak area on soils derived from sedimentary rocks.

The species name commemorates Postar Miun, well-known plant collector at the Sandakan herbarium, who assisted with my field studies in Sabah.

9. Porterandia rarissima *MS Zahid,* **sp. nov.** *Porterandiae subsessili (Val.) Ridl. similis sed bracteis inflorescentiae parvis anguste triangularibus et pedicellis florum 5–10 mm longis*

differt. Typus: Shea & Minjulu SAN 75959 Sabah, Kudat, 1½ mile southeast of Kg Bawing on Bengkoka Peninsula (6 Sep 1972) (holotypus SAN).

(Fig. 9)

Tree, to 16 m high, to 25 cm diameter, not buttressed. Bark smooth to grid-cracked; dark grey to brown. Shoot tips, distal branch internodes, petioles and leaf veins with erect-suberect hairs. Stipules ovate-triangular and fused along the edges to form a tube, 1–1.5 cm long, densely hairy. Mature **leaves** (not immature leaves near the shoot-tips) with petiole obsolete or subobsolete, only 0–0.15 cm long, 2–4 mm thick; lamina mostly obovate, 9–26 cm long, 5–9.6 cm wide; leaf base cuneate; leaf apex obtuse; when dry chartaceous; midrib on upper side flattened to slightly raised, sparsely hairy to densely hairy, on lower side distinctly prominent, sparsely hairy to densely hairy; secondary veins 9–16 pairs, on upper side flattened to slightly raised, on lower side distinctly prominent; tertiary venation a much-branched network between pairs of secondary veins. **Bisexual inflorescences** not known in the flowering state, with the following information inferred from fruiting cymes: peduncle about 0.4 cm long; habit laxly branched, with 2 distinct branching orders, the 1st-order branches 5–6 mm long, the 2nd-order branches 4–5 mm long; bracts on ultimate/penultimate cyme branches narrowly triangular, less than ⅓ the length of the flower calyx; flowers 4–7 per cyme, usually in 1–2 clusters; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes broad triangular, 1–1.5 mm long and less than ⅓ the length of the calyx limb; flowering pedicels and corolla not known. **Female inflorescences** not known in the flowering state, with the following information inferred from fruiting cymes: habit unbranched, with only one flower, bracts on ultimate/penultimate cyme branches narrowly triangular, less than ⅓ the length of the flower calyx; calyx tube/limb densely covered by hairs (most of calyx surface hidden); calyx lobes broadly triangular to ovate, 3–4 mm long and less than ⅓ the length of the calyx limb. Mature fruiting stalk developing from bisexual inflorescence 4–5 cm long, or if developing from unbranched female inflorescence 2.5–3 cm long. **Fruit** sub-globose to ellipsoid, 3–4.6 cm long, 2.4–3.4 cm wide, short-tomentose when young, becoming glabrous. Seeds flattened, lens-shaped to rounded, 4–5 mm × 5–6 mm, testa surface finely areolate.

DISTRIBUTION. Sabah only (apparently restricted to the Kudat-Kota Marudu-Pitas area in the extreme northern part), lowland secondary forest.

SPECIMENS EXAMINED—BORNEO. SABAH: Kudat, 1½ ml [2 km] SE of Kg Bawing on Bengkoka Peninsula, *Shea & Minjulu* SAN 75959 (6 Sep 1972 fruits) female (holotype SAN); Kota Marudu, Kg Lampada, *Aban* SAN 99489 (6 Aug 1983 fruits) bisexual (SAN); Pitas, Paitan F.R., *Ag Amin & George* SAN 121336 (16 May 1987 fruits) bisexual (KEP, SAN).

P. rarissima is a little-known species most closely related to *P. grandifolia* Ridl., *P. kalimantanensis* and *P. lambirensis*. They share the characters of having erect-suberect hairs

HOLOTYPE
UNIVERSITY OF MALAYA HERBARIUM (KLU)
Porterandia rarissimo Zahid
Det. M.S Zahid Date: 7 July 2002
HERBARIUM OF THE FOREST DEPARTMENT,
INDEXED SANDAKAN. SABAH, MALAYSIA.
Porterandia grandifolia Ridl.
det. Date 198
HERBARIUM OF THE FOREST DEPARTMENT.
SANDAKAN, SABAH, MALAYSIA.
Porterandia
det. INDEXED Date 197
FLORA OF SABAH
HERBARIUM OF THE FOREST DEPARTMENT SANDAKAN
No. San 75959
Family Rubiaceae
Botanical Name Gardenia. Randia
Det. Leiden 10/75.
Vernacular Dialect
Locality (see Reverse for map) About 1½ miles South-east of Kampong Bawing on Bengkoka Peninsula.
District Kudat Alt. 100 Ft. a.s.l.
Collector G. Shea & F. Minjulu Date 6.9.72
Habitat Secondary Forest in undulating lowlands.
Notes: Clear bole: 40ft.
Crown: 25ft.
Height: 65ft.
Girth: 3ft.
Outer bark: purple-dark grey/longitudinally horisonally cracked into flakes about 1-2cm square.
Inner bark: orange-red.
Sapwood: yellow-white.
Fruits: hard/green.
Duplicates to: K/L SAR/KEP/SING BO/PNH/AA/OX/
Herbaria receiving duplicates are requested to communicate new identifications to the Conservator of Forests, Sandakan, Sabah.
G.P. 20,000L.1/0890-7-72
INDEXED
75959

Fig. 9. The holotype specimen of *Porterandia rarissima* MS Zahid: *Shea* & *Minjulu* SAN 75959 (SAN).

on the shoot tips, petioles and leaf veins; leaves with obsolete or subobsolete petioles; and small, narrowly triangular inflorescence bracts. *P. rarissima*, however, differs from these species in having a short-pedunculate bisexual inflorescence, longer flower pedicels (5–10 mm long), and a rather long fruit-bearing stalk (to 2.5–3 cm long) in the female infructescence. The other species have either sessile to subsessile bisexual inflorescences or short flower pedicels (just 1–2 mm long), and short fruit-bearing stalks (to 1–2 cm long only) in the female infructescence.

ACKNOWLEDGEMENTS

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